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ABSTRACT

The purpose of this study is to describe and analyze Oregon's efforts to provide equal access to education, training, and information services to its citizens using advanced communication technologies through ED-NET, an innovative state agency for distance learning. It is noted that creation of ED-NET in 1989 required the coordination of multiple educational institutions, governmental agencies, private businesses, and legislative processes, as well as the development of three separate electronic networks, each with hardware and programming requirements. Discussion of the theoretical framework for the study reviews the forces influencing the development of ED-NET, including the political climate and culture as well as distance learning and information technologies. Methods and data sources for the study are then briefly described. The four significant themes considered to be critical to the successful implementation of ED-NET are discussed in some detail, including major problems they have created: (1) intra- and inter-agency cooperation; (2) economic self-sufficiency; (3) hardware issues; and (4) programming. It is noted that, despite initial setbacks, the ED-NET system has gradually begun to function and to demonstrate potential for the future. Four recommendations conclude the report. (ALF)

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Innovation and the Process of Change:
A Case Study in Distance Education

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Introduction

> ...there is no more delicate matter to take in hand, nor more dangerous to conduct, nor more doubtful in its success, than to set up as a leader in the introduction of changes. (Niccolo Machiavelli, The Prince)

The purpose of this study is to describe and analyze one state's efforts to distribute education, training, and information services to its citizens by initiating an innovative state agency for distance learning. My goal was to offer meaning to a complex educational innovation as it emerged amidst political forces, to describe the interaction between the people and organizations at the state level and to offer understanding of the goals and purposes of those organizations responsible for implementing this project in the classroom. This study provides a broad perspective of the forces and interactions which have influenced that implementation.

Background

Oregon created an agency, ED-NET, in 1989 charging it with the goal to provide equal access to a variety of information resources using advanced communication technologies for all Oregon's citizens. This complex state-wide technological highway, designed to deliver courses and teleconferences, required coordination of multiple educational institutions, governmental agencies, private businesses, and legislative processes. Initial planning included the development of three separate electronic networks, each with hardware and programming requirements.

Implementation of a technological program typically begins with a concentration on the hardware, and ED-NET did begin this way. However, in this instance the focus on the hardware did not begin to address the complex and interrelated activities among the bureaus, agencies, organizations, associations, and individuals. Relevant issues included policy decisions (e.g., scheduling, faculty personnel questions, residency coordination among intra-state universities); equity concerns (e.g., geographic and physical access to the hardware, pricing of courses; educational appropriateness); and the impact of distance courses on the educational system throughout the state.

We know from previous research that the fate of most innovations rests in the hands of those responsible for their implementation, yet those individuals are usually ignored (Fullan, 1982; Gall & Renchler, 1985). Frequently the scapegoat for lack of implementation is the individual within an organization who does not embrace someone else's view of a needed change. Innovations frequently proceed as if the power to propose and legislate changes obviates the need to develop constituencies and to reconcile competing self-interests among those constituent groups. Little time is given to the process of adaptation to change (Sarason, 1991).

Furthermore, attempts at innovation in schools have usually ignored institutional culture and traditions of a system. A state by state comparison of reform legislation found that the most widely adopted reforms were those that required the smallest organizational changes (Plank, 1988). McLaughlin summarized his extensive studies on educational change by stating that planned change efforts must be rigorous, but "not so ambitious that they require too much too soon from the implementing system" (1990, p. 15).

One might expect the ED-NET agency would foresee the problems and anticipate areas of resistance --after all, ED-NET initiators had spent years designing and promoting the establishment of this system. As citizens of Oregon they presumably knew the politics and culture of the state, and they referred to the literature base on the implementation process. Yet this innovation was plagued with difficulties and problems.

Theoretical Frame

ED-NET was not a static organization. It was helpful to view ED-NET as a web of interconnected relationships, where change and activity in one area produced reactions within other areas. The forces influencing the development of ED-NET had as much to do with the political climate and culture at the time as with distance learning and information technologies. As Fullan noted, "We need to keep in mind the dynamics of educational change as a sociopolitical process which involves all kinds of individual, classroom, school, local, regional, and national factors at work in interactive ways" (1982, p. 5).

I relied on an ecological approach to provide a dynamic examination of the development and implementation processes in this study (Hansen, 1979). Explanation and reflection from such a perspective required identification of the environmental factors most important in restraining or encouraging behavior by participants in the various social units.

I observed people and events to gain an understanding of participants' experiences and looked critically at the historical and underlying conceptualizations from which those participants operated. My effort was to provide interpretation of events from the insider's or emic perspective, and to offer descriptive research conducted in a natural setting.

Questions which guided the research were at the organizational, institutional and extra-organizational levels. I focused on the shifting of power sources, decision making procedures, communication channels and policy aspects. I was also concerned with the voices which were not heard in the planning and implementing phases.

Methods and Data Sources

I spent several months working with the individuals and groups responsible for ED-NET in settings where they naturally met during the evolution of political, educational and organizational structures. I relied extensively on ethnographic tools during the research, such as participant observations, nonparticipant observations, informal and semi-structured interviews, document collection, analysis, and reflection. In order to assist in description and examination of events I made an effort to include multiple sources and employ multiple techniques of data collection of the implementation on ED-NET.

The goals of this study were not achieved within a vacuum, but were mediated through my personal world views. My assumptions, experiences and hypotheses have guided the questions I asked, the people I chose to

interview and the way I interpreted each event. As an educator, researcher and participant in a variety of distance education fields, and also as one cautious about the impact of technology on society in general, I chose to study ED-NET thoroughly to offer my lenses and perspective to this emerging phenomenon.

Discussion

Oregon's legislature approved the creation of the ED-NET agency and gave a one time infusion of $8 million for the startup costs. This money came from lottery funds designated for economic development. More importantly, the legislature mandated that ED-NET become financially self sufficient within four years. A small group of enthusiasts from the business, education, government and public sectors set out to accomplish its goals within these restrictions.

The ED-NET agency struggled simultaneously with four significant themes as it established itself in Oregon. These four areas were critical to successful implementation and yet all created major difficulties. I shall briefly describe each of these themes.

Intra and Inter Agency Cooperation

The most critical need in the creation of this state-wide system was a well articulated communication system -- not electronic connections but rather a way in which agencies, governmental offices, educational policy makers and individuals could begin to talk, plan and cooperate with each other.

Historically, Oregon's vertical and horizontal layers within these disparate units had little experience working together or cooperating in meaningful ways. The Oregon tax and funding structure more typically fostered competition for limited resources.

Failure to adequately develop these lines of communications, and delays in building cooperative groups, interfered with the development of ED-NET. More distressing, however, was the lack of involvement by potential end users of the technological highway. Teachers, local school districts and potential students in the programs to be broadcast were not given any meaningful part in the process.

Economic Self-Sufficiency

The start-up funding and self-sufficiency mandate created enormous problems for the fledgling organization. The $8 million represents a small commitment of resources, given the costs of hardware, the need for reaching all parts of Oregon, and the necessity for staff for the agency. Other states have begun similar systems with much larger amounts (e.g., Iowa, with approximately the same number of people and half the land area, began with $50 million). The lack of adequate funding resulted in over-cautious investment in personnel and programming.

The need to become self sufficient resulted in even more problems. Each school building, library and other entity was forced to join ED-NET individually at a fairly hefty cost. Although public monies had been used to

establish the system, each member had to pay yearly fees. Moreover, for each course or teleconference, participants had to pay a fee.

A one-time conference was not too expensive, when one considered the savings in time and travel expenses. For ongoing classes, however, the situation was different. If a school wished to offer a Japanese language class it was necessary to pay a per student fee each semester (these typically cost $300 per student). The public schools seldom had enough discretionary funds to pay for several students to take a course, and many schools complained that the courses should be free since they were created and delivered on public funding.

One charge hurled at the ED-NET staff concerned this need to make money. It was said that their activities resembled the marketing ploys one would expect from fledgling business more than an educational or governmental organization.

Hardware Issues

Current efforts in distance education rely heavily on telecommunication technologies - satellite transmissions, electrical equipment, uplink stations and downlink receivers. Many distance education systems concentrate on the hardware to the exclusion of all other issues and then find themselves with a well established hardware infrastructure that no one uses.

The ED-NET agency spent considerable resources to establish its hardware systems; unfortunately, everything did not go smoothly. An engineer was

not hired prior to ordering the equipment and vital electronic monitoring items were never ordered. Land on which to build the uplink was not purchased in time and this resulted in massive delays plus an extra expense for moving the signals to a preexisting uplink. The schedule for installation of downlinks was considerably delayed so that few locations could pick up the few programs that were scheduled. Finally, an untried technology was chosen for one component of the system and then it failed to materialize as promised.

These hardware problems reduced the confidence of potential state users and delayed the start of operations. ED-NET was even forced to rent equipment to honor some commitments which depleted their small budget. Overall the beginnings were halting and tenuous in most respects.

Programming

While one segment of the ED-NET staff concentrated on hardware, another group went around the state signing up members. Universities, community colleges, K-12 schools, libraries and others joined ED-NET with the promise of essentially free equipment in exchange for a yearly fee.

The organizations wanted some scheduling assurances as to what programming would be available for which groups of students. ED-NET could not promise anything, given the delays in hardware installations. Further, the agency expected schools to develop classes and broadcast them using the satellite for others to purchase. Schools insisted ED-NET should produce programming, offer start-up funding or at least guarantee that a

minimum number of schools would subscribe to a class if it were offered. This dilemma produced a stalemate for a considerable amount of time.

Again, delays in programming and in hardware installation resulted in lack of participation by schools and lack of enthusiasm. One community college proceeded with development of courses, announced satellite delivery of those courses and signed up students based on the assurances by ED-NET. When the course was to begin, the hardware was not in place and the community college delivered the lectures on video tape amid frustration and disappointment.

Conclusion

Political, educational, special interests, businesses and individuals forces combined to almost derail the implementation process of ED-NET. Delays in installation of hardware, development of programming and creation of communication channels exacerbated the already fractious nature of the organizations and threatened the first tenuous steps toward cooperative arrangements.

Throughout the first year of operation organizations doubted that any programming would be delivered. Eventually a few courses were started, and although only a few students were registered, the technology did work. Governmental teleconferences were held and those also worked well. These demonstration projects proved to be positive in marketing ED-NET.

Eventually ED-NET began to offer stipends to encourage creation of distance learning courses, promoted interaction among users of the system and created some demonstration projects showing alternative activities. A programming staff person was hired and teachers were approached in an effort to diminish hostility and fear. Oregon's governor held a series of conversations with citizens using the network and this increased its popularity. Gradually the system has begun to function and to demonstrate potential for the future.

Recommendations

The results of the study demonstrate the recurring nature of problems associated with implementation of educational innovations. Lessons have been learned in the past, but apparently each new implementation process must struggle with the same issues. In this situation the following points would have smoothed the implementation process and might serve to make future attempts at network building more successful:

The building of cooperative constituencies among disparate organizational cultures requires thoughtful and planned strategies; leaving the development to chance invites failure.

Significant time must be given to the development and establishment of a new innovation with availability of resources during the beginning stages.

All groups who may need to support an innovative organization must be brought into the planning stages - including end users.

Financial considerations almost destroyed the potential for establishing this state wide network. Educational organizations, political forces, individual needs, and economic realities constantly buffeted ED-NET. It is most important to recognize the pressures which impact all educational innovations. These forces intensify difficulties inherent in the integration and implementation of new technologies into established organizations.

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